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STATISTICAL DATA ON SCIENCE AND TECHNOLOGY OF 1986

RESEARCH AND DEVELOPMENT INSTITUTIONS SUBORDINATE TO GOVERNMENT DEPARTMENTS

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Wellcome Centre for Medical Science

THE STATE SCIENCE AND
TECHNOLOGY COMMISSION OF
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FOREWORD

Science and technology——key factors for promoting social civilization and progress——have more and more vigorously drawn attention of almost all creators, managers and policy decision–makers of the social wealth. Naturally, people are concerned about whether the input made to science and technology will meet the needs of the social and economic development and be in step with development goals of the country, what role has been played by the government, and whether the efforts made by scientists and technicians will match the scientific and technological achievements, in particular, when judging from the angle of international comparison and from the angle of looking forward to the future. We hope the 1986 Statistics on Science and Technology will be helpful to readers of various circles in making judgements.

The 1986 Statistics on Science and Technology give a general picture of research and development (R&D) institutions subordinate to government departments at different levels and their personnel, funds, scientific and technological (S&T) projects, scientific technological works and technology transfers as well as their distribution by branches of national economy, geographic districts and fields of study. Statistical data concerning institutions of higher learning, enterprises and others are not included here.

This is the second year to compile the nationwide statistics on science and technology. The 1986 Statistics on Science and Technology continue by and large to use the same indicators, concepts, definitions and basic frame structures as those of 1985 Statistics on S&T, thereby keeping on the whole their comparability and compatibility with international standards and national practices in China. Compared with 1985, the 1986 Statistics on Science and Technology have been supplemented with the funds of R&D institutions and materials about social sciences and humanities.

In completing the statistics, credit should first go to the scientific and technological statisticians of provinces, autonomous regions and municipalities directly under the Central Government, ministries under the State Council as well as R&D institutions. It is their sense of responsibility and realistic spirit which ensure the realiability of basic data. The State Science and Technology Commission must acknowlege a heavy debt to the many working in governments at all levels and R&D institutions who have helped prepare the statistics. The statistics are now presented to all of those who care for and support the development of science and technology in China.

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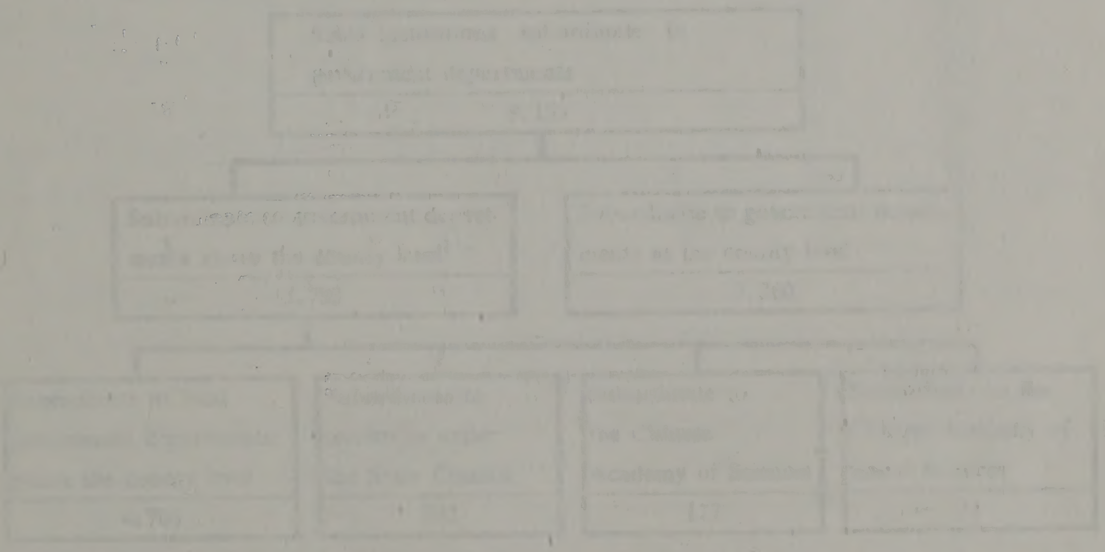
1.1.1 Institutions Subordinate to Government Departments

In 1986, there are [illegible] R&D institutions subordinate to government departments [illegible]

In 1986, there are [illegible] R&D institutions [illegible] institutions [illegible] thousand scientists and engineers[1] as well as a total annual fund amount of 11,44[illegible] million yuan [illegible]

According to the administrative subordination of R&D institutions, the management system of R&D institutions subordinate to government departments is as follows (Fig.1.1):

Fig. 1.1 The management system of R&D institutions subordinate to government departments


R&D institutions subordinate to government departments
Subordinate to government departments above the county level[2]
Subordinate to government departments at the county level
Subordinate to local government departments above the county level
Subordinate to ministries under the State Council
Subordinate to the Chinese Academy of Sciences
Subordinate to the Chinese Academy of Social Sciences

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[1] Scientists and engineers refer to the personnel of university or higher educational level or [illegible] with [illegible] titles.

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Chapter I

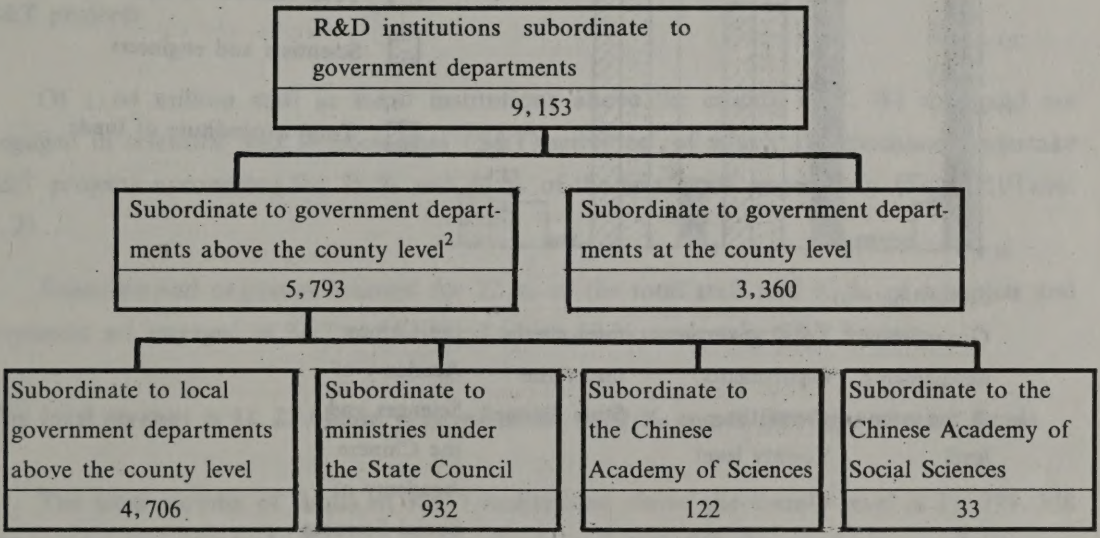
R&D Institutions Subordinate to Government Departments

In 1986, there are in China 9,153 R&D institutions subordinate to government departments

In 1986, there are in china 9,153 research and development institutions (R&D institutions) subordinate to government departments with a total staff of 1,119 thousand of which 343 thousand are scientists and engineers[1] as well as a total annual fund income of 11.44 billion yuan (RMB, current price) and a total annual actual expenditure of 11.15 billion yuan.

According to the administrative subordination of R&D institutions, the management system of R&D institutions subordinate to government departments is as follows (Fig.1.1):

Fig. 1.1 The management system of R&D institutions Subordinate to government departments


R&D institutions subordinate to government departments
9,153
Subordinate to government departments above the county level[2]
5,793
Subordinate to government departments at the county level
3,360
Subordinate to local government departments above the county level
4,706
Subordinate to ministries under the State Council
932
Subordinate to the Chinese Academy of Sciences
122
Subordinate to the Chinese Academy of Social Sciences
33

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1) Scientists and engineers refer to S&T personnel of university or higher educational level or conferred with senior or intermediate academic titles.

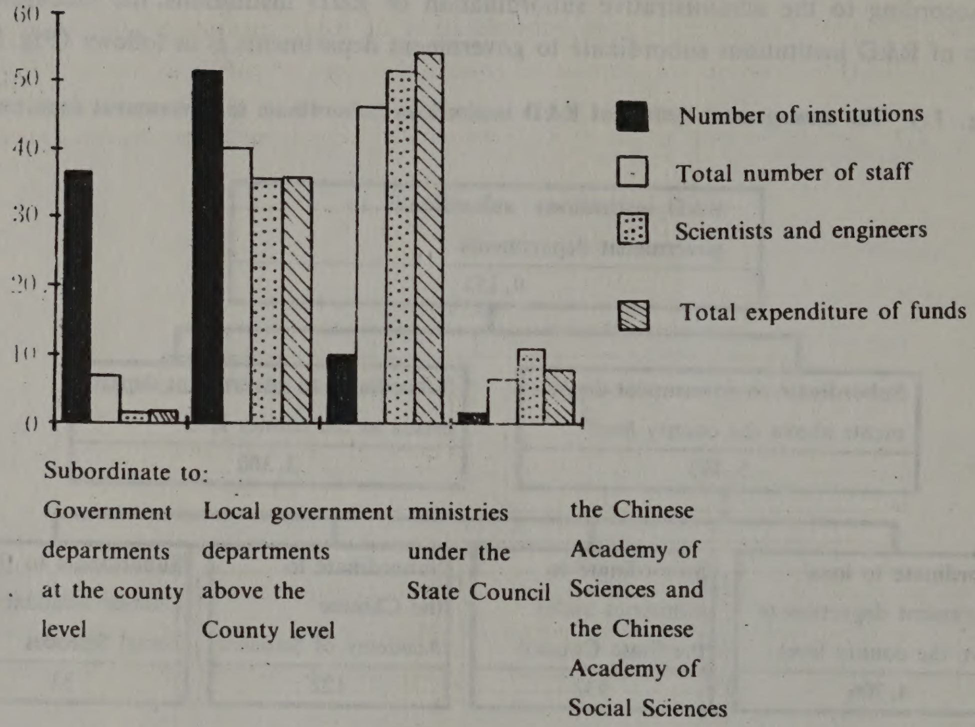
2) Local government departments above the county level include those subordinate to government departments of provinces, autonomous regions and municipalities directly under the Central Government as well as those of prefectures and cities.

R&D institutions subordinate to ministries under the State Council account for 10 % of China's total in number and around an half in both staff number and expenditures

Among R&D institutions subordinate to government departments, R&D institutions subordinate to government departments above the county level, in particular, to ministries under the State Council, are of great input preponderance in number, staff and funds (Fig. 1.2, Table 1.1):

- R&D institutions subordinate to government departments above the county level account for 63 % of the total number of institutions, 93 % of total staff and 98 % of total expenditure.
- R&D institutions subordinate to ministries under the State Council account for 10 % of the number of institutions, 46 % of staff and 54 % of expenditure.

Fig.1.2 Institutions and their personnel and funds by subordinative relation (%)



Chapter Ⅱ

R&D Institutions Subordinate to Government Departments above the County Level

There are in China 5,793 R&D institutions subordinate to government departments above the county level with a staff of 1.04 million and a total expenditure of 10.9 billion yuan

There are in China 5,793 R&D institutions subordinate to government departments above the county level (hereinafter referred to as R&D institutions above the county level) with a staff of 1,040,830 of which 336,432 are scientists and engineers and a total expenditure of funds of 10,934,920 thousand yuan.

In R&D institutions above the county level, institutions in the field of natural science and technology account for 90 % or more of the total number and 98 % of both staff and funds (Table 2.1).

Of 1.04 million staff, 75 % are engaged in S&T activities and 31 % undertake S&T projects

Of 1.04 million staff in R&D institutions above the county level, 781 thousand are engaged in scientific and technological (S&T) activities[1], of which 322 thousand undertake S&T projects, accounting for 75 % and 31 % of the total staff respectively (Fig.2.1, Table 2.2).

Scientists and engineers account for 32 % of the total staff and 95 % of scientists and engineers are engaged in S&T activities, of which 63 % undertake S&T projects.

The total revenue is 11.23 billion yuan, of which 64.9 % comes from government funds

The total income of funds of R&D institutions above the county level is 11,229,358 thousand yuan, of which the government funds is 7,290,050 thousand yuan and business

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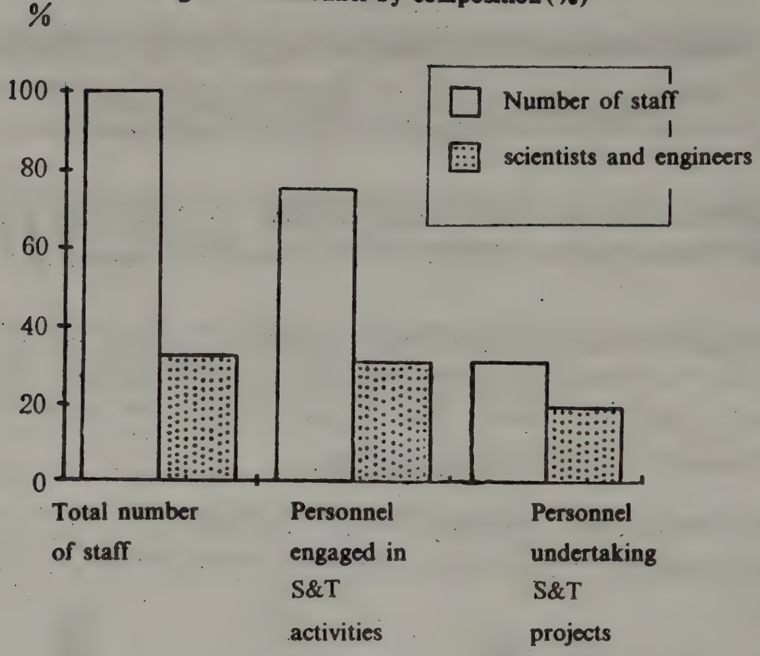
1) Personnel engaged in S&T activities, comprises persons undertaking S&T projects, S&T auxiliary personnel, S&T managerial personnel, personnel working in laboratories, workers in pilot factories (workshops) and farms; not including car drivers, janitors personnel working in mess halls, medical houses, kindergartens, nurseries and labor service companies, and sanitation workers.

Fig.2.1 Personnel by composition (%)



income is 2, 764, 720 thousand yuan, accounting for 64.9 % and 24.6 % of total income respectively (Fig.2.2, Table 2.3).

The total expenditure is 10.93 billion yuan, of which labour costs and capital expenditure account for 15.7 % and 35.0 % respectively

The total expenditure is 10, 934, 920 thousand yuan, of which labour costs are 1, 711, 876 thousand yuan and capital expenditure is 3, 840, 439 thousand yuan, accounting for 15.7 % and 35.1 % of total expenditure[1] (Fig.2.2, Table 2.3).

100 thousand S&T projects were conducted with a fund input of 2.32 billion yuan and a personnel input of 322 thousand persons.

In 1986, R&D institutions above the county level undertook 100, 362 S&T projects, of

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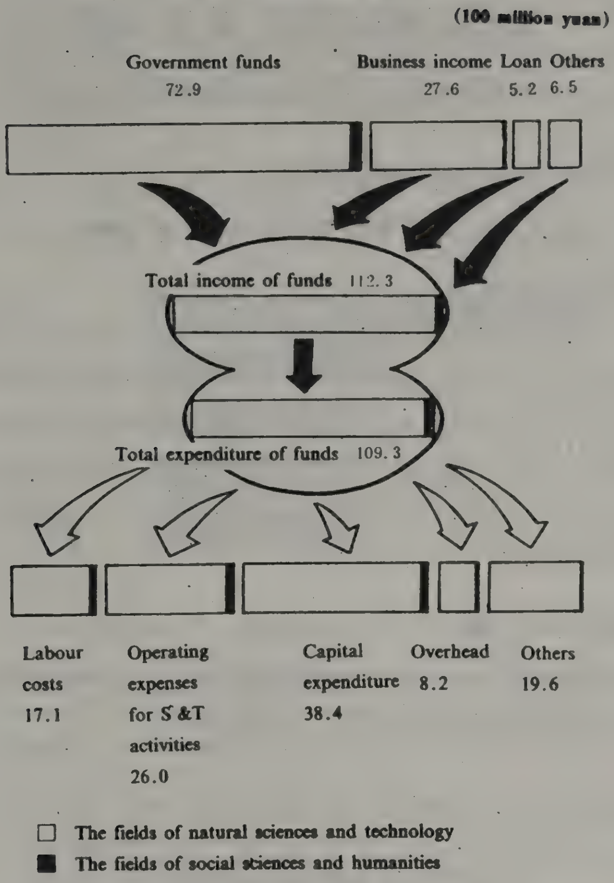
1) Labour costs comprise the total payment for labour paid to staff members and workers in cash or in kind, including wages and salaries, bonuses, welfare subsidies as well as payment for retired personnel and collective welfare expenditures.

Capital expenditure comprises the actual expenditure in capital investment and actual expenditure in fixed assets using non–capital investment funds.

Fig.2.2 Income and expenditure of funds


(100 million yuan)
Government funds 72.9
Business income 27.6
Loan 5.2
Others 6.5
Total income of funds 112.3
Total expenditure of funds 109.3
Labour costs 17.1
Operating expenses for S&T activities 26.0
Capital expenditure 38.4
Overhead 8.2
Others 19.6
☐ The fields of natural sciences and technology
■ The fields of social sciences and humanities

which 50,643 are new ones of the year, accounting for 50.5 % of the total. The fund input of projects is 2,321,162 thousand yuan, or 23.1 thousand yuan on the average for one project and the personnel input is 321,876 persons, or 3.2 persons on the average for one project (Table 2.4).

69 thousand scientific papers and S&T writings of 631 million of Chinese characters were published

In 1986, 69,230 scientific papers[1] were completed, of which 5,706 or 8.2% were issued abroad; S&T writings of 631,449 thousand Chinese characters were published, of which 15,888 thousand Chinese characters or 2.5 % were translated into foreign languages (Table 2.5).

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1) Scientific papers comprise those published in national journals, academic publications, journals of key institutions of higher learning, provincial and municipal academic publications issued throughout the country and those published abroad.

Section 1

R&D institutions in the fields of natural sciences and technology

1. Institutions and their personnel and funds

There are 5,271 R&D institutions with a staff of 1.02 million and a total expenditure of 10.76 billion yuan

In the fields of natural science and technology[1], there are in China 5,271 R&D institutions subordinate to government departments above the county level (hereinafter referred to as R&D institutions in the fields of natural science and technology above the county level) with a total staff of 1,020,468, of which 324,760 are scientists and engineers and a total annual fund income of 11,042,007 thousand yuan and a total annual actual expenditure of 10,759,573 thousand yuan.

By subordinative relation:

— Local R&D institutions above the county level account for 80.2 % of the total and around 40 % of both total personnel and fund input;

— R&D institutions subordinate to ministries under the State Council account for 17.5 % of the total and more than 50 % of the total personnel and fund input (Fig.2.3, Table 2.6).

142 new R&D institutions were set up in 1986

In 1986, there were 142 new R&D institutions, of which 130 were set up by local government departments above the county level.

A larger proportion of R&D institution is geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy; however, the input of S&T personnel and funds constitutes a larger proportion for manufacturing industries

So far as service objects of R&D institutions are concerned, R&D institutions above the county level and their personnel and fund input constitute, by branch of national economy, the largest proportion in agriculture, forestry, animal husbandry, fishery and water

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1) The field of natural science and technology comprises natural sciences, engineering and technology, medical sciences and agricultural sciences.

conservancy(29. 3 %, 17. 0 % and 10. 1 % respectively) as well as in manufacturing industries (35. 9 %, 45. 4 % and 46. 9 % respectively) ; a proportion less than 8 % in sanitation, sports and social welfare ; and a proportion only 2–3 % in geological survey and prospecting, construction, communication, transport, posts and telecommunications and environmental protection (Fig.2.4, Table 2.7).

Fig.2.3 Institutions and their personnel and funds by subordinative relation (%)

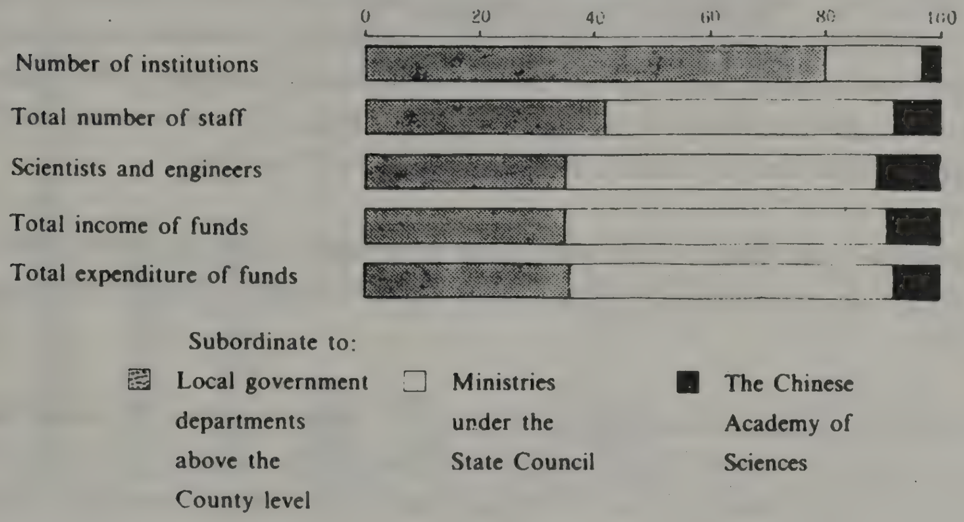
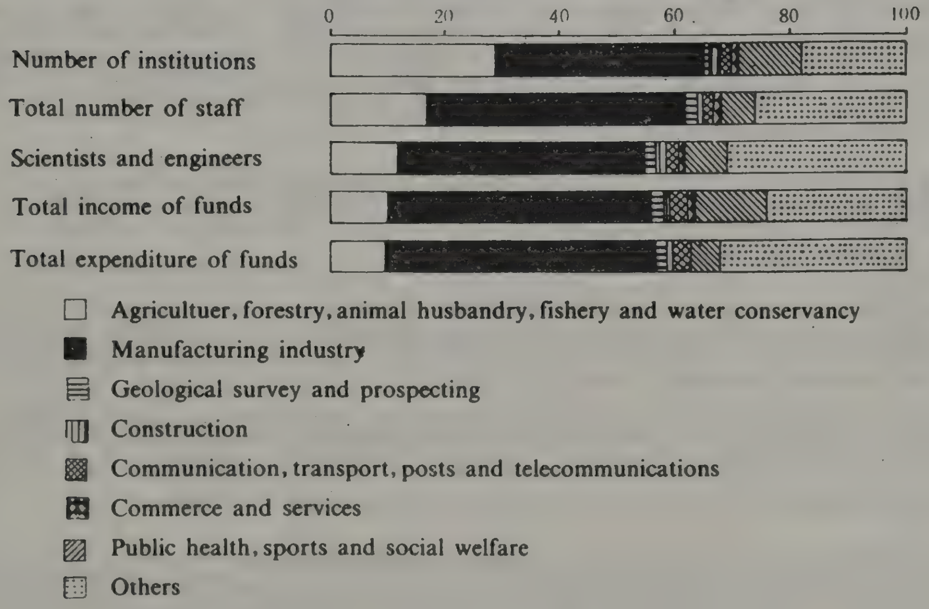


Fig.2.4 Institutions and their personnel and funds by branch of national economy (%)



The number of R&D institutions is larger in Beijing, Liaoning and Jiangsu; while that of input of personnel and funds is larger in Beijing, Shanghai and Sichuan

R&D institutions above the county level and their personnel and fund input differ obviously in geographical districts. The proportion of the number of institutions to China's corresponding total is larger in Beijing, Liaoning and Jiangsu and smaller in Xizang (Tibet), Qinghai and Ningxia, the difference among them being insignificant. However, the proportion of personnel and funds of institutions to China's corresponding total differ greatly among districts and is significantly larger in Beijing, Shanghai and Sichuan, but is obviously lower in Nei Monggol, Fujian, Guizhou, Xizang, Qinghai and Ningxia (Table 2.8).

R&D institutions subordinate to local government departments above the county level are mostly of small size, while those of ministries under the State Council are mostly of large and medium size

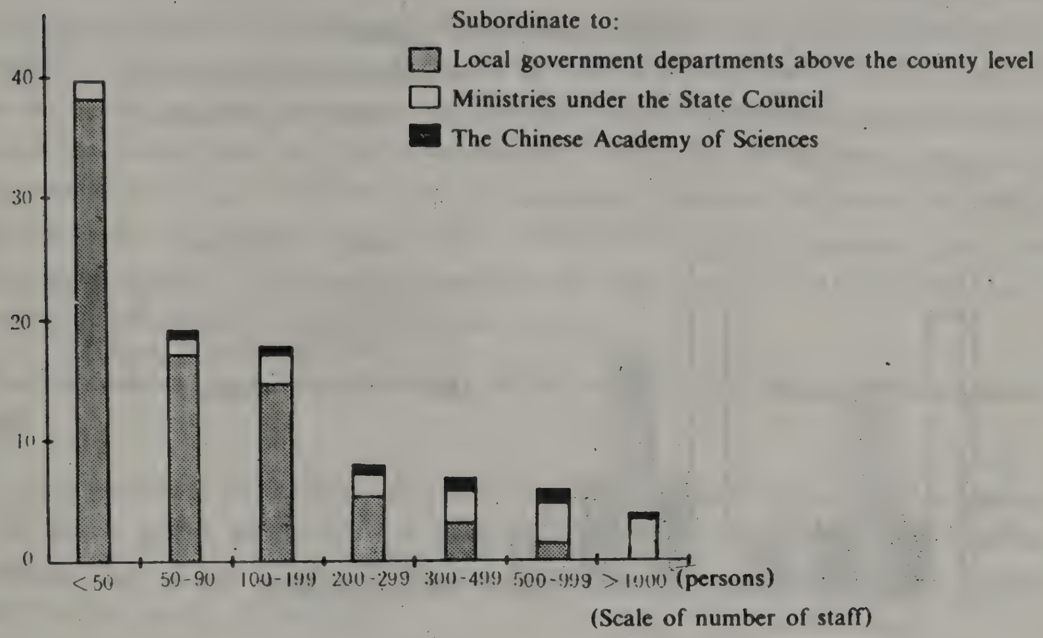
In the fields of natural science and technology, R&D institutions above the county level are mostly of medium and small size. Institutions of small size with less than 100 persons account for 58.6 % of the total number of institutions; those of medium size with 100–299 persons, 25.1 % and those of large size with more than 300 persons, 16.2 % . Institutions subordinate to local government departments above the county level are mostly of small size and institutions with less than 100 persons are all subordinate to local government departments above the county level; while institutions subordinate to ministries under the State Council and those subordinate to the Chinese Academy of Sciences are mostly of medium and large size, and institutions with more than 300 persons account for more than half of the total number of institutions (Fig. 2.5, Table 2.9).

1, 149 R&D institutions become self–sufficient in operating expenses and require less operating expenses from the government

In 1986, 1, 149 R&D institutions becoming self–sufficient in operating expenses or having their operating expenses reduced in varying degrees account for 21.8 % of the total number of institutions, of which 833 institutions are subordinate to local government departments above the county level and 316 are subordinate to ministries under the State Council, accounting for 19.7 % and 34.3 % of the total number of institutions.

The total number of staff members, income of funds and expenditure of the institutions mentioned above account for 36.7 %, 40.4 % and 40.6 % respectively of the corresponding total and are greatly higher than the proportions of the number of the institutions to the total (Table 2.10).

Fig.2.5 Institutions grouped by number of staff(%)



2. Personnel

There is one scientist or technician in every four staff members in R&D institutions subordinate to local government departments above the county level and in every two staff members in institutions subordinate to the Chinese Academy of Sciences

Of 1.02 million staff members of institutions above the county level in the field of natural science and technology, scientists and engineers account for 31.8 %, an increase of 1.8 % over 1985. The proportions of scientists and engineers in institutions subordinate to local government departments above the county level, ministries under the State Council and the Chinese Academy of Sciences rise in proper order of 26 %, 34 % and 50 % respectively.

3 / 4 of the staff members are engaged in S&T activities and 1 / 3 participate in S&T project teams

The proportion of personnel engaged in S&T activities and undertaking S&T projects to the total number of staff members differs slightly from that in 1985.

Of the total number of staff members, 75 % of which are engaged in S&T activities and 31 % directly undertake S&T projects. Scientists and engineers are mostly engaged in S&T activities and directly undertake S&T projects, accounting for 95 % and 60 % respectively (Fig.2.6, Table 2.11).

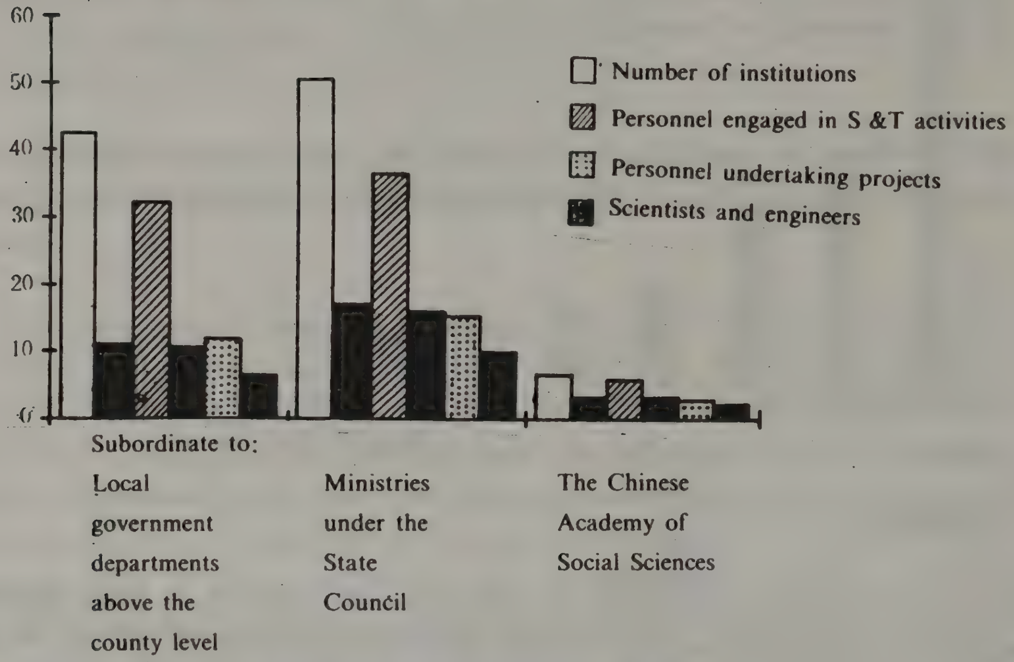


Fig.2.6 **Personnel by composition subordinative relation (%)**
(The total number of staff in R &D institutions subordinate to government departments above the county level in fields of natural sciences and technology is taken as 100 %)

In S&T project teams, most personnel are scientists and engineers

Of personnel undertaking S&T projects, scientists and engineers account for 62 % on average. This proportion is low in institutions subordinate to local government departments above the county level, accounting for only 54 %, while it is high in institutions subordinate to the Chinese Academy of Sciences, up to 76 % (Table 2.11).

Female staff members account for 37 %

In institutions above the county level in the fields of natural science and technology, there are 379 thousand female staff members, accounting for 37. 1 % of the total staff members. The proportion of female staff members engaged in S&T activities and undertaking S&T projects are 71. 4 % and 25. 2 % respectively, which are all smaller than the corresponding proportions contributed by male staff members. Female scientists engineers account for 91 thousand, 23.9 % of the total of female staff members. This proportion is also lower than the proportion of male staff members. (Table 2.11).

The proportion of scientist and technician in R&D institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy is relatively low

In R&D institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy, scientists and engineers account for 23.2 % of the total staff members, which is much lower than the nation's corresponding average level; in institutions geared to the needs of manufacturing industries, public health, sports and social welfare, education, culture and arts, radio and television as well as financing and insurance, the proportion fluctuates around 31.8 %; in institutions geared to the needs of geological survey and prospecting, construction, communication and transport, posts and telecommunications, environmental protection and others, the proportion is higher than the nation's corresponding average level (Table 2.12).

The proportion of scientist and technician in R&D institutions in Beijing and some places is high

The proportion of scientists and engineers working in R&D institutions to the nation's total differs greatly among districts. Beijing accounts for about 30 % over the nation's average, while Jiangxi and Guangxi account for 70 % — 80 % and Xizang only for about 50 % of the average (Table 2.13).

3. Funds

The total revenue is 11.04 billion yuan

In 1986, the total annual income of fund in R&D institutions above the county level in the fields of natural science and technology is 11,042,007 thousand yuan, of which institutions subordinate to local government departments above the county level account for 35.7 %; those subordinate to ministries under the State Council account for 56.4 %; those subordinate to the Chinese Academy of Sciences account for 7.8 %.

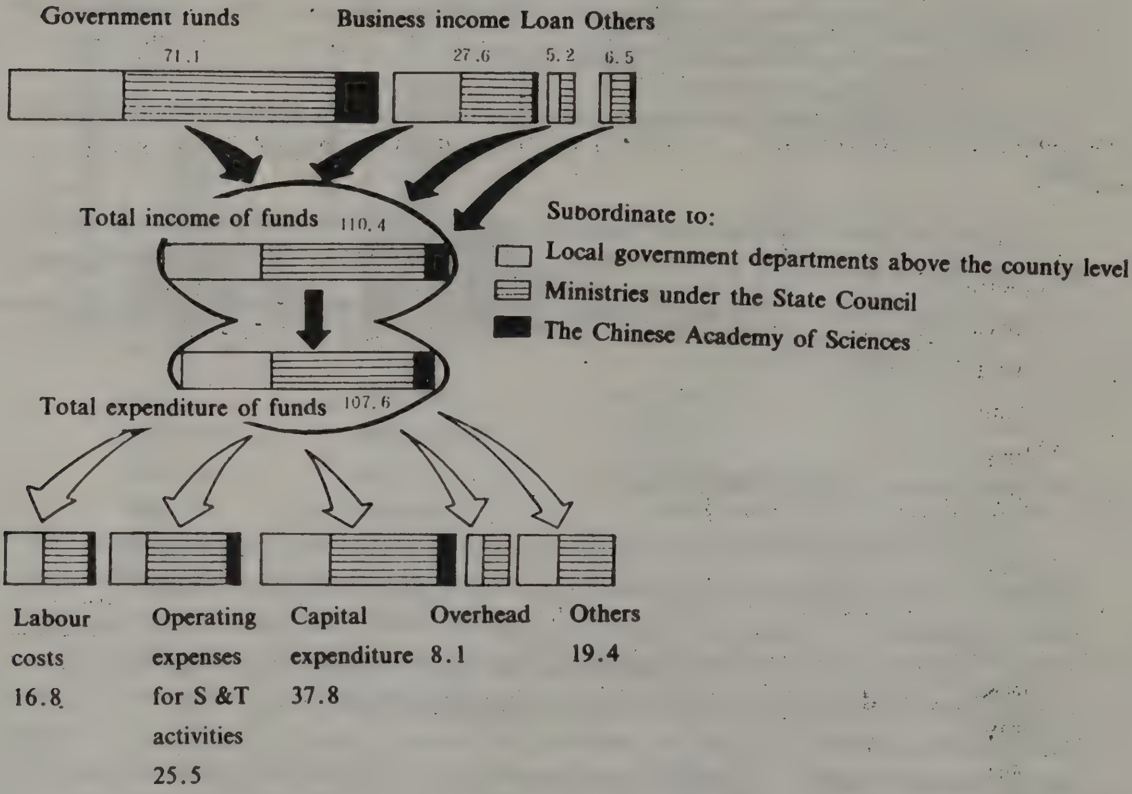
The government funds is 7.1 billion yuan, accounting for 64.4 % of the total revenue

The government funds to the above—mentioned institutions is 7,114,200 thousand yuan, an increase of 1.8 % over that in 1985, accounting for 64.4 % of the total fund income. The business income is 2,759,438 thousand yuan, roughly equal to that in 1985, accounting for 25.0 % of the total fund income. The government funds to the R&D institutions subordinate to local government departments above the county level, to ministries under the State Council and to the Chinese Academy of Sciences account for 31.3 %, 58.4 % and 10.2 % respectively of the total government funds.

The shares contributed by the government funds in total fund income increase successively for institutions subordinate to local government departments above the county level, to ministries under the State Council and to the Chinese Academy of Sciences as 56.5 %, 66.7 % and 84.1 % respectively; on the contrary, the shares of business income in total fund income decrease successively as 33.1 %, 22.2 % and 8.0 % respectively (Fig. 2.7).

Fig.2.7 Institutions and expenditure of funds(%)

(100 million yuan)



Government funds
71.1
Business income
27.6
Loan
5.2
Others
6.5
Total income of funds
110.4
Total expenditure of funds
107.6
Subordinate to:
☐ Local government departments above the county level
▤ Ministries under the State Council
■ The Chinese Academy of Sciences
Labour costs
16.8
Operating expenses for S &T activities
25.5
Capital expenditure
37.8
Overhead
8.1
Others
19.4

The share of government funds in fund revenue in R&D institutions geared to the needs of agriculture, forestry, animal husbandry, fishery, water conservancy and geological survey and prospecting is relatively high; the share of business income in fund revenue is relatively high in R&D institutions geared to the needs of industries, construction

By branch of national economy, the total fund income of institutions geared to the needs of manufacturing industries is 5.16 billion yuan, accounting for 46.7 % of the total fund income of the R&D institutions subordinate to government departments above the county level in the field of natural science and technology, and that of institutions geared to the needs of agriculture, 9.9 %.

The proportion of government funds to the total fund income averages out to 64.4 % of the nation's total, and the proportion of institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy, geological survey and prospecting, public health, sports and social welfare as well as environmental protection is relatively high, up to 75 % or more.

The proportion of business income to the total fund income averages out to 25.0 % of the nation's total. The proportion of institutions geared to the needs of manufacturing industries, construction, communication and transport, posts and telecommunications is relatively high, up to 30 % or more.

The total expenditure is 10.76 billion yuan

In 1986, the total expenditure of fund in R&D institutions above the county level in the fields of natural sciences and technology is 10,759,573 thousand yuan, of which institutions subordinate to local government departments above the county level account for 36.0 %; institutions subordinate to ministries under the State Council — 56.1 %; institutions subordinate to the Chinese Academy of Sciences — 7.9 %.

Of the total expenditure of fund, labour costs account for 15.6 %; operating expenses for S&T activities — 23.7 %; capital expenditure — 35.1 %. The proportions of above-mentioned funds differ insignificantly among institutions of different subordinative relations.

The proportion of labour costs in fund expenditure in R&D institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy is relatively high; while that of capital expenditure in fund expenditure is relatively high in R&D institutions geared to the needs of public health, sports and social welfare

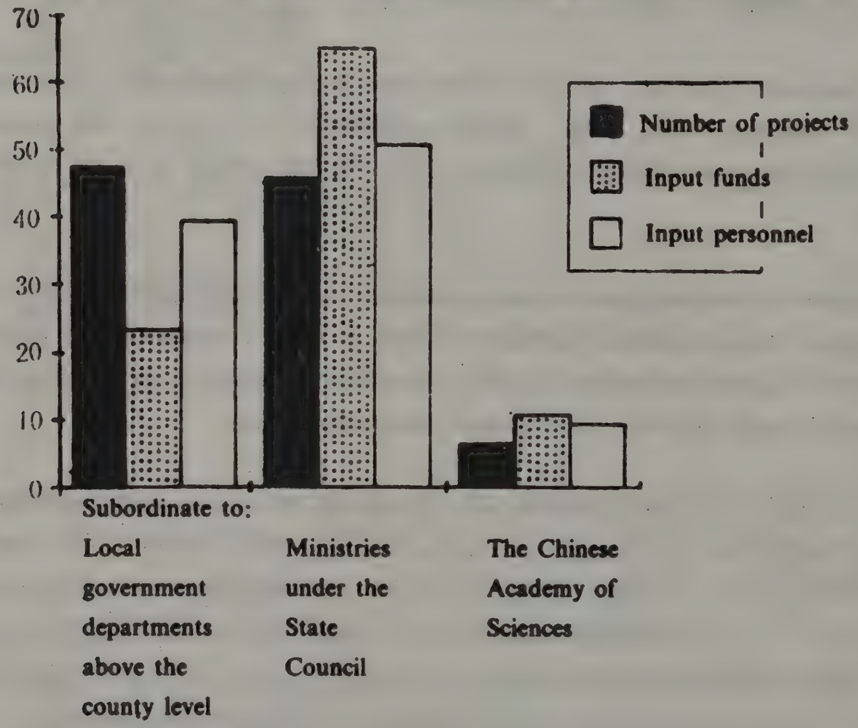
By branch of national economy, the expenditure of fund in institutions geared to the needs of manufacturing industries accounts for 46.9 % of the nation's total; that of institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy — 10.1 %. There exists difference of fund expenditure among institutions geared to the needs of different branches of national economy: labour costs in institutions geared to the needs of agriculture, forestry, animal husbandry, fishery, water conservancy, real estate, utilities, personal and consultation services account for up to over 23.0 %, which is higher than the nation's corresponding average; while the capital expenditures of institutions geared to the needs of public health, sports, social welfare and environmental protection account for 50.2 % and 48.2 % respectively, which are much higher than the nation's corresponding average.

4. S&T projects

95 thousand S&T projects were conducted with a fund input of 2.32 billion yuan and a personnel input of 312 thousand persons

In 1986, 95, 482 scientific and technological projects were carried out in R&D institutions above the county level in the fields of natural sciences and technology with a fund input of 2, 303, 099 thousand yuan and a personnel input of 312, 497 persons, of which 193, 307 are scientists and engineers. The number of S&T projects in institutions subordinate to local government departments above the county level and to ministries under the State Council accounts for 47.5 % and 45.9 % respectively of the nation's total; the fund input and personnel input of S&T projects in institutions subordinate to local government departments above the county level and to ministries under the State Council account for 65.3 % and 50.7 % respectively of the nation's total (Fig.2.8, Table 2.14).

Fig.2.8 S &T projects and inputs by subordinative relation (%)



Nearly 50 % of S&T projects were newly set up in 1986

Of S&T projects carried out in 1986, 47,439 are new projects, accounting for 49.7 % of the total. Institutions subordinate to local government departments above the county level have the largest proportion of new projects started in that every year, up to 52.3 %; while those for institutions subordinate to ministries under the State Council and the Chinese Academy of Sciences are 49.4 % and 32.8 % respectively. The proportion of new S&T projects in the fields of engineering and technology, accounting for 63.6 %, is bigger than that in the fields of agricultural sciences (19.2 %) and in the fields of natural sciences (10.7 %).

The average input of personnel and funds in S&T projects is slightly lower than that in 1985

In 1986, the average personnel and fund input for each S&T project is 3.3 persons and 24.1 thousand yuan, slightly lower than those in 1985. Institutions subordinate to local government departments above the county level have the larger reduction in average personnel and fund input than those subordinate to the Chinese Academy of Sciences, while institutions subordinate to ministries under the State Council have a higher average personnel and fund input than those in 1985. This results in a broader gap in average personnel and fund input for each S&T project among institutions subordinate to local government departments above the county level, institutions subordinate to ministries under the State Council and institutions subordinate to the Chinese Academy of Sciences. The ratios of average personnel and fund input for each S&T project among the three change from 1:1.2:1.7 in 1985 to 1:1.3:1.8 in 1986 and from 1:1.6:2.8 in 1985 to 1:2.9:3.4 in 1986 respectively.

The input in S&T projects in the fields of engineering and technology is the largest

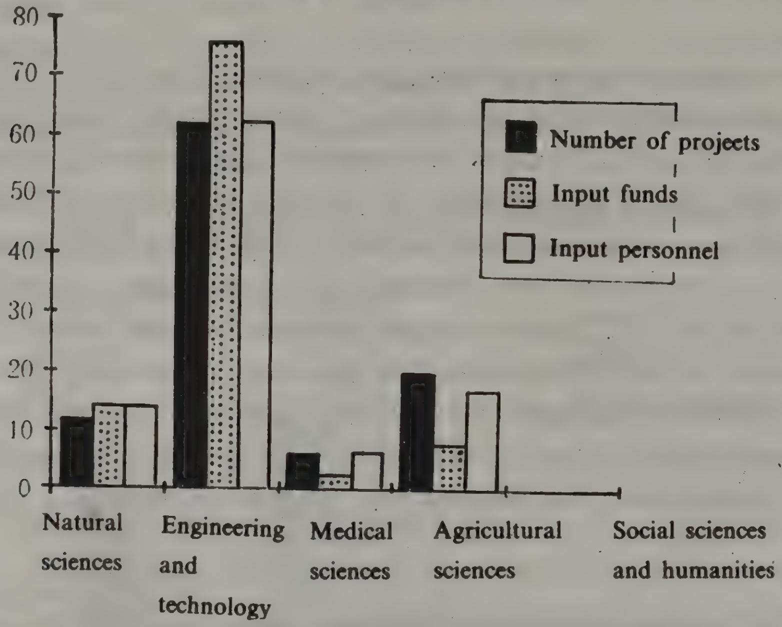
The number of S&T projects and their fund and inputs in the fields of engineering and technology account for 61.9 %, 75.4 % and 62.1 % of the nation's corresponding totals respectively (Fig. 2.9, Table 2.15). Institutions subordinate to local government departments above the county level have larger proportions of number of S&T projects in the fields of agricultural sciences and medical sciences, while institutions subordinate to ministries under the State Council and to the Chinese Academy of Sciences have larger proportions in the fields of natural sciences and engineering and technology.

5. Scientific and technological works

50 thousand scientific papers and S&T writings of 370 million Chinese characters were published

In 1986, 50, 496 scientific papers and S&T writings and with 369, 608 thousand Chinese characters in the fields of natural sciences and technology were published by R&D institutions above the county level. Scientific papers issued by institutions subordinate to local government departments above the county level, to ministries under the State Council and to the Chinese Academy of Sciences account for 35 %, 43 % and 22 % of the total respectively; while S&T writings published by the three account for 36 %, 49 % and 15 % of the total respectively (Table 2.16).

Fig. 2.9 S &T projects and inputs by field of study (%)



9 % of scientific papers were published abroad and 3.6 % of S&T writings were translated into foreign languages

4, 566 scientific papers were issued abroad, accounting for 9 % of the total, S&T writings with 13,342 thousand Chinese characters were translated into foreign languages, accounting for 3.6 % of the total of Chinese characters of S&T writings. Nearly one fifth of papers issued by the Chinese Academy of Sciences were published abroad, accounting for 46 % of the total of papers published abroad.

The proportion of scientific papers published abroad and of S&T writings translated into foreign languages is higher in the field of natural sciences

Scientific papers published abroad and scientific writings translated into foreign languages in the fields of natural sciences account for over half of the total (51.6 % and 54.9 % respectively), those in the fields of engineering and technology account for about 1/4 (29.6 % and 26.4 % respectively). In the fields of natural sciences, 15.5 % of scientific papers were issued abroad, 8.8 % of S&T writings were translated into foreign languages, the proportions are obviously higher than those in other fields of study (Table 2.17).

6. Technology transfer

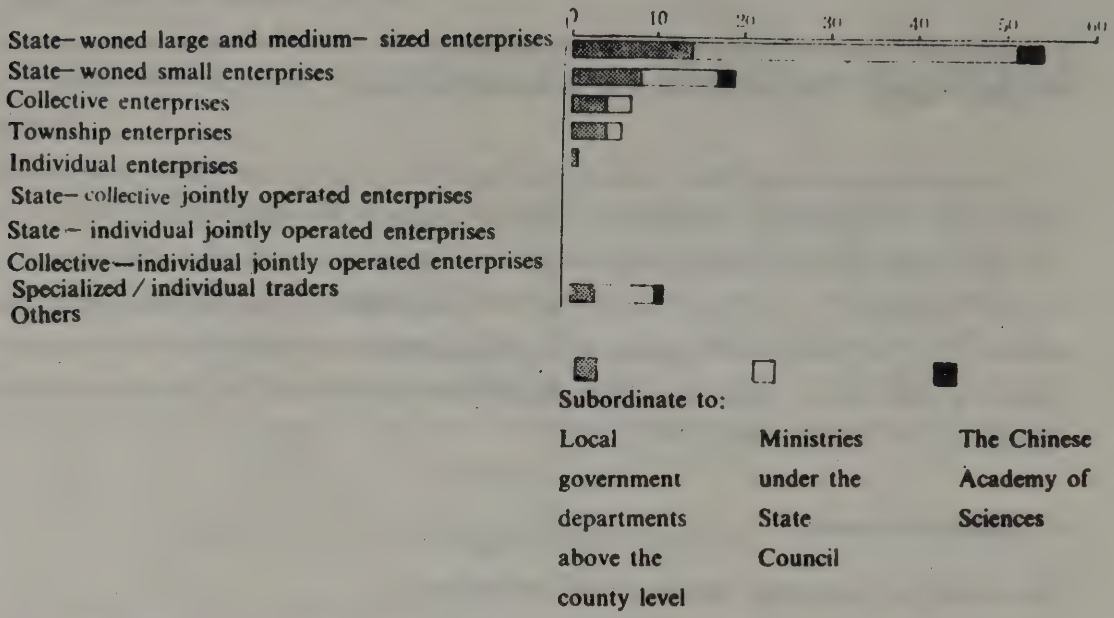
The volume of technology transfer is 707 million yuan

In 1986, the volume of technology transfer in the fields of natural sciences and technology from R&D institutions above the county level came up to 706,599 thousand yuan, of which institutions subordinate to local government departments above county level, to ministries under the State Council and to the Chinese Academy of Sciences account for 34.8 %, 58.7 % and 6.5 % respectively (Table 2.18).

The volume of technology transfer made with state–owned large and medium–sized enterprises accounts for 54.7 %

The volume of technology transfer made with state–owned large and medium–sized enterprises is 386,199 thousand yuan, accounting for 54.7 % of the total volume of technology transfer; that made with state–owned small enterprises is 133,191 thousand yuan, accounting for 18.8 %; that made with collective enterprises, village and township enterprises and individual enterprises totals 101,664 thousand yuan, accounting for 14.4 %. The share of volume of technology transfer made with state–owned large and medium–sized enterprises is mostly contributed by R&D institutions subordinate to ministries under the State Council, accounting for 68.1 % of the total volume; while that made with collective, village and township and individual enterprises is mostly contributed by institutions subordinate to local government departments above the county level, accounting for 61.1 % (Fig. 2.10).

Fig.2.10 The volume of technology transfer by type of transferee(%)



The major aim of technology transfer is to promote the industrial development

As for socio-economic aims or objectives of the technology transfer, the volume of technology transfer for the promotion of industrial development came up to 380 million yuan, accounting for 54.1 % of the total volume; those for the development of agriculture, forestry and fishery and for the development of transport and communication each were over 60 million yuan, both accounting for 9 %; that for the production, conservation and distribution of energy was close to 50 million yuan, accounting for 7 %. The proportion of the volume of technology transfer in the development of agriculture, forestry and fishery contributed by R&D institutions subordinate to local government departments above the county level is relatively high, accounting for 16.4 %; while that in the promotion of industrial development and energy by R&D institutions subordinate to ministries under the state council is higher than the nation's corresponding average (Table 2.19).

Section 2

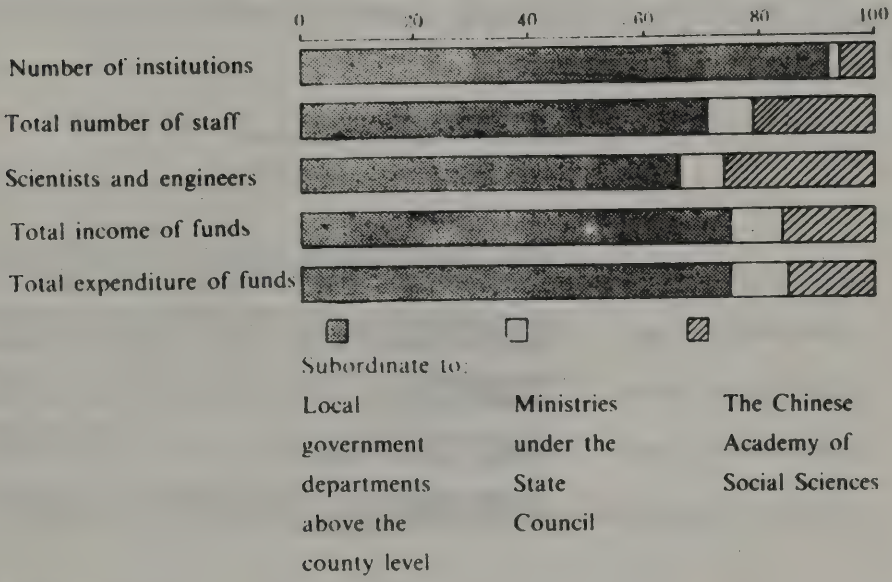
R&D institutions in the fields of social sciences and humanities

There are 522 R&D institutions with a staff of 20 thousand or more and a total expenditure of 175 million yuan

There were in China in the fields of social sciences and humanities 522 R&D institutions subordinate to government departments above the county level (hereinafter referred to as institutions above the county level in the fields of social sciences and humanities) with a total staff of 20, 362, of which 11, 672 are scientists and engineers, and with a total fund income of 187, 351 thousand yuan and a total expenditure of 175, 347 thousand yuan.

By subordinative relations, R&D institutions in the fields of social sciences and humanities and their personnel and funds are mostly concentrated in local government departments above the county level (Fig.2.11, Table 2.20).

Fig.2.11 Institutions and their personnel and funds by subordinative relation (%)



1 / 3 of R&D institutions with nearly 1 / 4 personnel and funds are engaged in the research and development of economics

R&D institutions and their personnel and fund inputs above the county level in the fields of social sciences and humanities are mostly concentrated in the fields of economics, accounting for 36. 6 %, 24. 4 % and 24. 5 % respectively of the corresponding total of institutions above the county level in the fields of social sciences and humanities (Fig.2.12, Table 2.21).

4 / 5 of staff members are engaged in S&T activities and 2 / 5 participate in S&T project teams

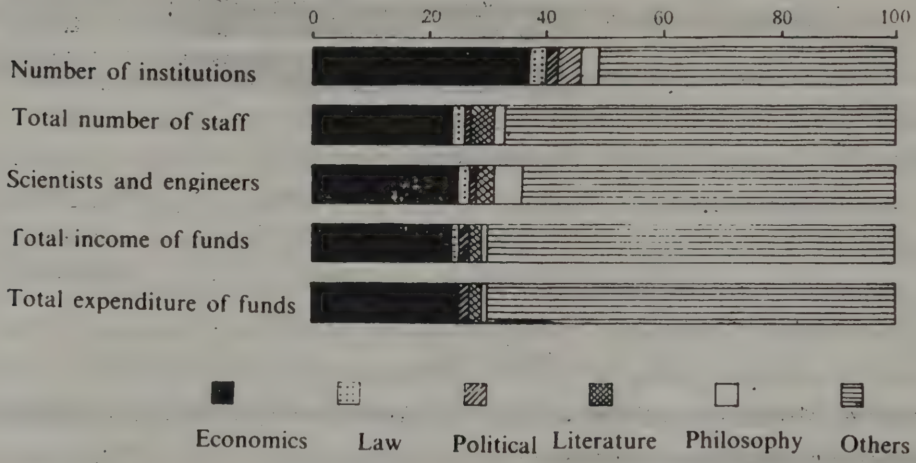
In R&D institutions above the county level in the fields of social sciences and humanities, the proportion of scientists and engineers to the total of staff members and the proportions of the personnel engaged in S&T activities and undertaking S&T projects to the total of staff members are 57.3 %, 81.5 % and 46.1 % respectively. The proportion of scientists and engineers undertaking S&T projects to the total of S&T project staff members is up to 79.4 % (Tabel 2.22).

The total fund revenue is 187 million yuan and the total expenditure 175 million yuan

In 1986, the total income of fund is 187,351 thousand yuan, of which government funds is 175,850 thousand yuan, accounting for 93.9 % of the total income.

The total expenditure is 175,347 thousand yuan, of which labour costs, operating expenses for S&T activities and capital expenditure account for 20.2 %, 24.3 % and 36.9 % respectively.

Fig.2.12 Institutions and their personnel and funds by field of study (%)



Nearly 5 thousand S&T projects were conducted

In 1986, R&D institutions above the county level in the fields of social sciences and humanities undertook 4,880 S&T projects, of which 3,204 or 65.7 % are new projects. The personnel input is 9,379 persons, or 1.9 persons on the average for one project (Table 2.23).

19 thousand scientific papers and S&T writings of 262 million Chinese characters were published

In 1986, 18,734 scientific papers were published, of which 1,140 were issude abroad, accounting for 6 % of the total number of scientific papers issued, and scientific writings with 261, 841 thousand Chinese characters were published, of which 2, 546 thousand Chinese characters were translated into foreign languages, accounting for 1 % of the total of Chinese characters of the scientific works.

Chapter Ⅲ

R&D Institutions Subordinate to Government Departments at the County Level

There are 3,360 R&D institutions subordinate to government departments at the county level

In 1986, there were in China 3,360 R&D institutions subordinate to government departments at the county level (hereinafter referred to as institutions at the county level) with a total staff of 78 thousand, of which 6 hundred, or 7.9 %, are scientists and engineers, and a total annual actual expenditure of 210 million yuan.

As compared with 1985, the proportion of increase in number of S&T personnel[1] is larger than that of increase in number of institutions and in total number of staff.

The number of R&D institutions at the county level and their total number of staff members and funds in mid–South China, especially in Hunan Province are the largest

Among China's six geographical districts, R&D institutions at the county level and their total number of staff and total expenditure in mid–South China account for 35.4 %, 44.3 % and 47.3 % respectively of the nation's corresponding total. Especially the number of R&D institutions at the county level and their total number of staff and funds in Hunan Province alone are roughly equal to those in districts of North China, East China, Southwest China and Northwest China (Fig.3.1, Table 3.1).

R&D institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy account for more than 3 / 5

R&D institutions at the county level geared to the needs of agriculture, forestry, animal husbandty, fishery and water conservancy, and their total number of staff and funds account for 62.2 %, 79.8 % and 71.7 % respectively of the nation's

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1) S&T personnel comprises personnel possessing the cultural level of specialized secondary school or higher education and those conferred with junior or his (or her) academic titles.

corresponding total, while those geared to the needs of manufacturing industries, in particular, the agricultural machinery, rank second. The average fund for each staff member in institutions geared to the needs of manufacturing industries is much higher than that in institutions geared to the needs of agriculture, forestry, animal husbandry, fishery and water conservancy (Fig.3.2, Table 3.2).

Fig.3.1 **Institutions and their personnel and funds by geographic district (%)**

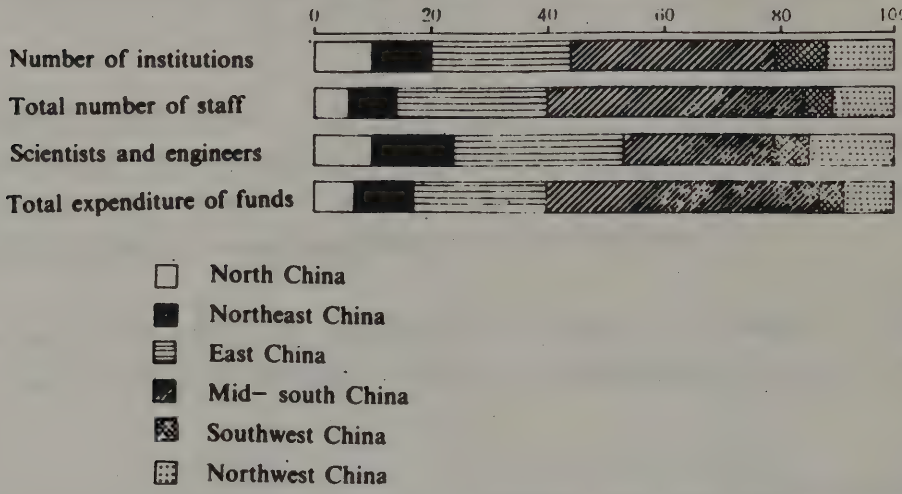
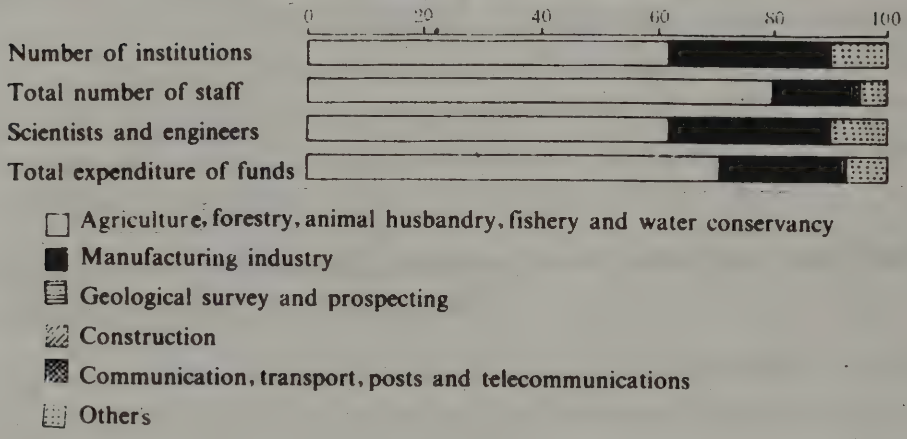


Fig.3.2 **Institutions and their personnel and funds by branch of national economy (%)**



Statistical Tables

Ⅰ. R&D Institutions Subordinate to Government Departments

Tab.1.1 Institutions and their personnel and funds by subordinative relation

	Number of institutions	Total number of staff			Total income of funds (thounsand yuan)	Total expenditure of funds (thousands yuan)
			Scientists and engineers	Other S&T personnel		
Total	9,153	1,119,165	342,604	223,479	11,443,945	11,149,507
Subordinate to :						
Government departments at the county level	3,360	78,335	6,172	17,013	214,587	214,587
Government departments above the county level	5,793	1,040,830	336,432	206,466	11,229,358	10,934,920
of which:						
Local government departments above the county level	4,706	449,089	122,432	100,753	4,005,906	4,006,874
Ministries under the State Council	932	516,843	175,939	95,636	6,247,828	6,050,714
The Chinese Academy of Sciences	122	70,510	34,989	9,540	866,316	850,702
The Chinese Academy of Socail Sciences	33	4,388	3,072	537	29,308	26,630

Ⅱ. R&D Institutions Subordinate to Government Departments above the County Level

Tab.2.1 Institutions and their personnel and funds by field of study

	Number of institutions	Total number of staff			Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel	
Total	5,793	1,040,830	336,432	206,466	10,934,920
Natural sciences and technology	5,271	1,020,468	324,760	202,080	10,759,573
Social sciences and humanities	522	20,362	11,672	4,386	175,347

Tab.2.2 Personnel by composition, field of study

(person)

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Total	1,040,830	336,432	206,466	780,560	320,081	177,314	321,876	200,754	79,132
Of which: Female	385,027	95,079	89,627	273,332	86,167	73,969	97,109	50,858	28,495
Natural sciences and technology	1,020,468	324,760	202,080	763,972	309,007	173,779	312,497	193,307	77,576
Of which: Female	378,905	95,017	87,847	270,657	83,713	72,663	95,419	49,589	28,104
Scoial sciences and humanities	20,362	11,672	4,386	16,588	11,074	3,535	9,379	7,447	1,556
Of which: Female	6,122	4,562	1,780	2,675	2,454	1,306	1,690	1,269	391

Tab.2.3 Income and expenditure of funds by field of study

(thousand yuan)

	Total income of funds			Total expenditure of funds		
		Government appropriation	Business income		Labour costs	Capital expenditure
Total	11,229,358	7,290,050	2,764,720	10,934,920	1,711,876	3,840,439
Natural sciences and technology	11,042,007	7,114,200	2,759,438	10,759,573	1,676,442	3,775,696
Social sciences and humanities	187,351	175,850	5,282	175,347	35,434	64,743

Tab.2.4 S&T projects and inputs by field of study

	Number of projects			Actual fund expenditure in 1986 (thousand yuan)	Personnel input in 1986	
	(item)	Started in 1986	Completed in 1986		(person)	Scientists and engineers
Total	100,362	50,643	37,004	2,321,162	321,876	200,754
Natural sciences and technology	95,482	47,439	34,168	2,303,099	312,497	193,307
Social sciences and humanities	4,880	3,204	2,836	18,063	9,379	7,447

Tab.2.5 S&T works by field of study

	Scientific papers		S&T writings	
	(article)	Issued aborad	(thousand Chinese characters)	Translate into foreign languages
Total	69,230	5,706	631,449	15,888
Natural sciences and technology	50,496	4,566	369,608	13,342
Social sciences and humanities	28,734	1,140	261,841	2,546

Ⅱ.1. R&D institutions subordinate to government departments above the county level in the field of nature sciences and technology

Tab.2.6 Institutions and their personnel and funds by subordinative relation

	Number of institutions	Total number of staff			Total income of funds (thousand yuan)	Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel		
Total	5,271	1,020,468	324,760	202,080	11,042,007	10,759,573
Subordinate to :						
Local government departments above the county level	4,227	434,669	114,701	97,117	3,945,471	3,875,110
Ministries under the State Council	922	515,289	175,070	95,423	6,230,220	6,033,761
The Chinese Academy of Sciences	122	70,510	34,989	9,540	866,316	850,702

Tab.2.7 Institutions and their personnel and funds by branch of national economy

	Number of institutions	Total number of staff			Total income of funds (thousand yuan)	Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel		
Total	5,271	1,020,468	324,760	202,080	11,042,007	10,759,573
Agriculture, forestry, animal husbandry, fishery, water conservancy	1,547	173,696	40,378	29,194	1,096,116	1,084,490
Manufacturing industries	1,892	463,630	139,874	89,489	5,159,591	5,043,345
Geological survey and prospecting	71	17,716	7,839	3800	175,233	163,008
Construction	99	13,988	5,746	2,963	132,416	122,193
Communication, transport, posts and telecommunications	108	20,560	7,449	5,504	275,649	272,265
Commerce, public catering trade, materials supply and marketing, storage	42	1,880	690	557	19,839	18,906
Real estate, utilities, personal and consultation services	27	2,635	645	526	21,331	20,680
Public health. sports and social welfare	409	52,123	16,951	20,996	516,469	486,968
Education, culture, arts, radio and television	31	1,557	544	345	18,105	16,188
Environmental protection	98	10.419	4.493	2.325	108,809	105,095
Financing, insurance	2	144	42	22	2,124	1,913
Others	945	262,112	100,109	46,359	3,516,325	3,424,522

Tab.2.8 Institutions and their personnel and funds by geographic district

	Number of institutions	Total number of staff			Total income of funds	Total expenditure of funds
		(person)	Scientists and engineers	Other S&T personnel	(thousand yuan)	(thousand yuan)
Total	5 271	1 020 468	324 760	202 080	11 042 007	10 759 573
Subtotal: North China	1 023	291 049	108 739	53 316	3 919 826	3 525 106
Beijing	393	194 096	79 540	33 688	2 762 182	2 627 553
Tianjin	144	36 342	10 810	7 628	403 326	369 959
Hebei	159	25 127	8 542	5 001	225 672	216 235
Shanxi	192	20 972	5 715	4 281	223 077	206 798
Nei Monggol	135	14 512	4 132	2 718	105 569	104 561
Subtotal: Northeast China	712	108 479	34 449	23 970	1 090 773	1 096 850
Liaoning	332	54 915	17 548	11 622	614 748	634 002
Jilin	149	28 405	8 456	6 266	238 361	224 624
Hei longjiang	231	25 159	8 445	6 082	237 664	238 244
Subtotal: East China	1 392	242 529	76 120	46 657	2 511 206	2 499 097
Shanghai	242	96 075	30 624	19 248	1 136 905	1 088 324
Jiangsu	301	54 400	17 742	10 113	555 647	560 126
zhejiang	150	18 450	6 565	3 413	181 930	183 466
Anhui	182	17 101	5 574	3 204	153 566	147 132
Fujian	121	9 960	3 697	1 817	92 010	99 196
Jiangxi	129	17 168	3 873	2 617	111 276	112 839
Shandong	267	29 645	8 045	6 245	279 872	308 014

Tab.2.8

	Number of institutions	Total number of staff (person)			Total income of funds (thousand yuan)	Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel		
Subtotal: Mid–South China	1 038	152 868	43 125	32 286	1 417 500	1 439 834
Henan	180	32 235	9 613	6 517	345 817	360 822
Hubei	248	40 159	11 648	9 672	328 222	324 188
Hunan	201	28 002	7 759	6 051	251 897	259 684
Guangdong	258	35 559	10 101	6 431	371 828	380 530
Guangxi Zhuangzu	151	16 913	4 004	3 615	119 736	114 610
Subtotal: Southwest China	557	121 823	31 779	24 356	1 243 708	1 164 546
Sichuan	277	91 151	23 122	17 828	924 503	882 675
guizhou	110	11 960	3 413	2 150	104 982	92 450
Yunnan	152	17 747	5 088	4 157	205 566	180 782
Xizang	18	965	156	221	8 657	8 639
Subtotal: Northwest China	549	103 720	30 548	21 495	1 058 994	1 034 120
Shanxi	195	63 071	18 324	12 591	656 669	619 488
Gansu	133	18 931	5 958	3 812	201 663	215 696
Qinghai	52	4 687	1 539	1 376	43 430	43 660
Ningxia Huizu	50	5 432	1 145	10 000	34 011	35 592
Xinjiang Uygur	119	11 599	3 582	2 716	123 221	119 684

Tab.2.9 Institutions grouped by number of staff

	Number of institutions	<50	50–99	100–199	200–299 person	300–499	500–999	>=1000
Total	5.271	2,092	999	927	398	357	307	191
Subordinate to:								
Local government departments above the county level	4,227	2,017	900	762	280	173	70	25
Ministries under the State Council	922	75	92	148	104	155	199	149
The Chinese Academy of Sciences	122	0	7	17	14	29	38	17

Tab.2.10 Personnel and funds of the institutions becoming self–sufficient in operating expenses and having their operating expenses reduced

	Number of institutions	Total number of staff			Total income of		Total expenditure of funds
		(person)	Scientists and engineers	Other S & T personnel	(thousand yuan)	government funds	(thousand yuan)
Total	1,149	374,327	121,484	73,804	4,465,844	2,328,320	4,369,823
Self–sufficent	273	62,143	15,033	11,644	835,294	202,065	821,882
X > 1/2	167	46,139	15,760	8,906	579,502	235,463	540,748
1/2>X > 1/3	191	42,434	14,477	9,140	476,697	247,182	462,783
X<1/3	518	223,611	76,214	44,114	2,574,351	1,643,610	2,544,410

$$X = \frac{\text{Portion of operating expenses reduced}}{\text{Original operating expenses}}$$

Tab.2.11 Personnel by composition, subordinative relation

(person)

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Total	1,020,468	324,760	202,080	763,972	309,007	173,779	312,497	193,307	77,576
Of which: Female	378,905	90,517	87,847	270,657	83,713	72,663	95,419	49,589	28,104
Subordinate to:									
Local government departments above the county level	434,669	114,701	97,117	330,876	109,794	86,039	123,622	67,018	38,034
Ministries under the State Council	515,289	175,070	95,423	372,989	164,718	78,963	158,538	103,145	34,692
The Chinese Academy of Sciences	70,510	34,989	9,540	60,107	34,495	8,777	30,337	23,144	4,850

Tab.2.12 Personnel by composition, branch of national economy

(person)

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Total	1,020,468	324,760	202,080	763,972	309,007	173,779	321,497	193,307	77,576
Agriculture, forestry, animal husbandry, fishery, water conservancy	173,696	40,378	29,194	122,036	39,042	25,361	53,484	28,540	14,384
Manufacturing industries	463,630	139,874	89,489	353,114	132,787	77,750	128,571	78,270	32,359
Geological survey and prospecting	17,716	7,839	3,800	13,734	7,436	3,088	6,253	4,745	1,127
Construction	13,988	5,746	2,963	10,978	5,342	2,633	3,920	2,381	1,097
Communication, transport, posts and telecommunications	20,568	7,449	5,504	16,074	7,210	4,712	7,374	4,774	1,998
Commerce, public catering trade, materials supply and marketing, storage	1,880	690	557	1,612	675	531	639	399	212
Real estate, utilities, personal and consultation services	2,635	645	526	2,243	629	463	787	411	235
Public health, sports and social welfare	52,123	16,951	20,996	38,174	15,666	17,444	16,622	9,349	6,835
Education, culture, arts, radio and television	1,557	544	345	1,248	538	297	507	385	104
Environmental protection	10,419	4,493	2,325	8,203	4,330	2,059	4,358	2,984	1,106
Financing, insurance	144	42	22	92	35	17	60	31	9
Others	262,112	100,109	46,359	196,464	95,317	39,424	89,922	61,038	18,110

Tab.2.13 Personnel by composition, geographic district

(person)

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Total	1,020,468	324,760	202,080	763,972	309,007	173,779	312,497	193,307	77,576
Subtotal: North China	291,049	108,739	53,316	224,660	104,217	46,212	97,294	66,636	20,563
Beijing	194,096	79,540	33,688	142,408	75,619	27,940	68,130	48,708	13,013
Tianjin	36,342	10,810	7,628	31,842	10,605	7,039	10,740	6,448	2,733
Hebei	25,127	8,542	5,001	19,772	8,240	4,551	8,933	5,871	2,341
Shanxi	20,972	5,715	4,281	18,381	5,670	4,031	5,022	2,984	1,320
Nei Monggol	14,512	4,132	2,718	12,257	4,083	2,651	4,469	2,625	1,156
Subtotal: Northeast China	108,479	34,449	23,970	83,351	33,049	21,225	32,540	19,981	9,272
Liaoning	54,915	17,548	11,622	40,507	16,863	10,089	16,684	10,194	4,665
Jilin	28,405	8,456	6,266	21,183	7,839	5,264	7,376	4,566	2,064
Heilongjiang	25,159	8,445	6,082	21,661	8,347	5,872	8,480	5,221	2,543
Subtotal: East China	242,529	76,120	46,657	184,921	73,148	41,117	70,478	43,683	18,180
Shanghai	96,075	30,624	19,248	74,937	29,693	17,552	28,160	16,874	7,760
Jiangsu	54,400	17,742	10,113	41,292	16,844	8,571	15,319	9,657	3,594
Zhejiang	18,450	6,565	3,413	14.881	6,374	3,080	6,395	4,365	1,516
Anhui	17,101	5,574	3,204	12,235	5,243	2,582	5,656	3,433	1,380
Fujian	9,690	3,697	1,817	8,705	3,636	1,730	3,432	2,279	775
Jiangxi	17,168	3,873	2,617	9,988	3,666	2,157	4,108	2,340	1,175
Shandong	29,645	8,045	6,245	22,883	7,692	5,445	7,408	4,735	1,980

Tab.2.13

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Subtotal: mid–South China	152,868	43,125	32,286	113,028	41,349	27,328	47,898	27,003	12,559
Henan	32,235	9,613	6,517	25,314	9,316	5,643	10,618	6,239	2,575
Hubei	40,159	11,648	9,672	30,184	11,048	8,239	13,188	7,385	3,917
Hunan	28,002	7,759	6,051	19,038	7,326	4,833	7,795	4,542	2,168
Guangdong	35,559	10,101	6,431	26,539	9,808	5,600	11,356	6,444	2,476
Guangxi Zhuangzu	16,913	4,004	3,615	11,953	3,851	3,013	4,941	2,393	1,423
Subtotal: Southwest China	121,823	31,779	24,356	82,049	28,797	19,645	34,535	18,497	9,108
Sichuan	91,151	23,122	17,328	59,960	20,631	14,149	25,163	13,236	6,184
Guizhou	11,960	3,413	2,150	8,770	3,222	1,787	3,395	2,056	777
Yunnan	17,747	5,088	4,157	12,864	4,804	3,520	5,709	3,110	2,028
Xizang	965	156	221	455	140	189	268	95	119
Subtotal: Northwest China	103,720	30,548	21,495	75,963	28,447	18,252	29,752	17,507	7,894
Shanxi	63,071	18,324	12,591	44,468	16,551	10,110	15,943	9,830	3,840
Gansu	18,931	5,958	3,812	15,486	5,827	3,624	6,718	3,724	1,903
Qinghai	4,687	1,539	1,376	3,379	1,466	1,256	1,526	863	502
Ningxia Huizu	5,432	1,145	1,000	3,525	1,098	862	1,320	698	403
Xinjiang Uygur	11,599	3,582	2,716	9,105	3,505	2,400	4,245	2,392	1,246

Tab.2.14 S&T projects and inputs by subordinative relation

	Number of projects			Actual fund expenditure in 1986	Personnel input in 1986	
	(item)	Completed in 1986	Started in 1986	(thousand yuan)	(person)	Scientists and engineers
Total	95,482	34,168	47,439	2,303,099	312,497	193,307
Subordinate to						
Local government departments above the county level	45,394	16,060	23,727	543,958	123,622	67,018
Ministries under the State Counci	43,871	16,094	21,672	1,502,906	158,538	103,145
The Chinese Academy of Sciences	6,217	2,014	2,040	256,235	30,337	23,144

Tab.2.15 S&T projects and inputs by field of study

	Number of projects			Actual fund expenditure in 1986	Personnel input in 1986	
	(item)	Completed in 1986	Started in 1986	(thousand yuan)	(person)	Scientists and engineers
Total	95,482	34,168	47,439	2,303,099	312,497	193,307
Natural sciences	11,096	4,013	5,074	326,119	44,098	30,847
Engineering and technology	59,081	24,299	30,188	1,737,425	194,147	121,975
Medical sciences	5,934	1,405	2,662	59,838	20,323	11,279
Agricultural sciences	18,744	4,176	9,129	174,938	52,301	28,150
Social sciences and humanities	627	275	386	4,779	1,628	1,056

Tab.2.16 S&T works by subordinative relation

	Scientific papers		S&T writings	
	(article)	Issued abroad	(thousnad Chinese characters)	Translate into foreign languages
Total	50,496	4,566	369,608	13,342
Subordinate to :				
Local government departments above the county level	17,775	743	133,972	3,552
Ministries under the State Council	21,870	1,714	181,502	5,660
The Chinese Academy of Sciences	10,851	2,109	54,134	4,130

Tab.2.17 S&T works by field of study

	Scientific papers		S&T writings	
	(article)	Issued abroad	(thousnad Chinese characters)	Translate into foreign languages
Total	50,496	4,566	369,608	13,342
Natural sciences	15,158	2,354	83,168	7,320
Engineering and technology	19,048	1,353	178,018	3,521
Medical sciences	6,217	460	34,535	590
Agricultural sciences	9,101	355	61,802	1,261
Social sciences and humanities	972	44	12,085	650

Tab.2.18 The volume of technology transfer by type of transferee

(thousand yuan)

	Total volume	1	2	3	4	5	6	7	8	9	10
Total	706,599	386,199	133,191	54,787	42,118	4,759	2,185	302	941	2,009	80,108
Subordinate to :											
Local government departments above the county level	246,240	104,194	53,284	28,832	28,599	4,678	1,012	206	465	1,997	22,982
Ministries under the State Council	414,812	262,872	64,816	22,635	12,545	76	1,093	96	473	12	50,194
The Chinese Academy of Sciences	45,538	19,133	15,091	3,320	974	5	80	0	3	0	6,932

1. state–owned large and medium–sized enterprises
2. state–owned small enterprises
3. Collective enterprises
4. Village and township enterprises
5. Individual enterprises
6. State–collective jointly operated enterprises
7. State–individual jointly operated enterprises
8. Collective–individual jointly operated enterprises
9. Specialized / individual traders
10. Others

Tab.2.22 Personnel by composition, subordinative relation

(person)

	Total number of staff			Personnel engaged in S&T activities			Personnel undertaking projects		
		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel		Scientists and engineers	Other S&T personnel
Total	20,362	11,672	4,386	16,588	11,074	3,535	9,379	7,447	1,556
Subordinate to:									
Local government departments above the county level	14,420	7,731	3,636	12,056	7,426	3,058	6,942	5,180	1,418
Ministries under the State Council	1,554	869	213	980	764	109	625	550	56
The Chinese Academy of Scoial Sciences	4,388	3,072	537	3,552	2,884	368	1,812	1,717	82

Tab.2.23 S&T projects and inputs by subordinative relation

	Number of projects			Actual fund expenditure in 1986 (thousand yuan)	Personnel input in 1986	
	(item)	Completed in 1986	Started in 1986		(person)	Scientists and engineers
Total	4,880	2,836	3,204	18,063	9,379	7,447
Subordinate to:						
Local government departments above the county level	4,236	2,526	2,791	14,601	6,942	5,180
Ministries under the State Council	196	146	165	1,230	625	550
The Chinese Academy of Scoial Sciences	448	164	248	2,232	1,812	1,717

Ⅲ. R&D Institutions subordinate to Government Departments at the County Level

Tab.3.1 Institutions and their personnel and funds by subordinative relation

	Number of institutions	Total number of staff (person)			Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel	
Total	3,360	78,335	6,172	17,013	212,993
Subtotal: North China	324	4,714	609	1,601	14,666
Beijing	33	830	126	286	2,136
Tianjin	5	134	21	81	248
Hebei	137	1,719	234	495	4,673
Shanxi	108	1,296	166	497	5,592
Nei Mongol	41	735	62	242	2,017
Subtotal: Northeast China	317	6,105	853	1,822	20,265
Liaoning	128	2,880	404	703	7,988
Jilin	35	783	154	192	6,062
Heilongjiang	154	2,442	295	927	6,215
Subtotal: East China	819	20,320	1,779	3,569	49,161
Shanghai	19	1,087	150	340	3,590
Jiangsu	164	5,045	570	1,121	16,886
Zhejiang	76	1,101	228	276	4,478
Anhui	86	2,339	175	320	3,116
Fujian	136	1,451	194	441	3,713
Jiangxi	206	7,760	193	606	11,043
Shandong	132	1,537	269	465	6,335
Subtotal: Mid-South China	1,190	34,707	1,580	5,051	100,666
Henan	173	4,572	300	905	15,036
Hubei	255	7,829	298	914	14,178
Hunan	301	11,923	438	1,412	21,690
Guangdong	294	7.344	363	1.257	43.561
Guangxi Zhuangzu	167	3,039	181	563	6,201
Subtotal: Southwest China	309	3,526	380	897	8,869
Sichuan	217	2,211	256	649	5,373
Guizhou	87	1,180	99	204	3,139
Yunnan	5	135	25	44	357
Xizang	0	0	0	0	0
Subtotal: Northwest China	401	8,963	971	4,073	19,366
Shanxi	106	2,001	295	909	4,540
Gansu	7	96	6	34	227
Qinghai	155	3,275	340	1,735	6,500
Ningxia Huizu	0	0	0	0	0
Xinjiang Uygur	133	3,591	330	1,395	8,099

Tab.3.2 Institutions and their personnel and funds by branch of national economy

	Number of institutions	Total number of staff (person)			Total expenditure of funds (thousand yuan)
			Scientists and engineers	Other S&T personnel	
Total	3,360	78,335	6,172	17,013	212,993
Agriculture, forestry, animal husbandry, fishery, and water conservancy	2,090	62,526	3,798	12,185	151,451
Manufacturing industries	895	10,534	1,639	3,259	45,033
Of which: Agricultural machinery	658	6,176	853	2,151	16,111
Geological survey and prospecting	6	39	8	10	101
Construction	22	391	44	94	948
Communication, transport, posts and telecommunications	4	205	2	11	94
Others	341	3,974	617	1,248	15,366